



## Quantrad Scout Gamma Spectroscopy System

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### SUMMARY

The Quantrad Scout system is a lightweight, comprehensive, portable gamma-ray spectroscopy system. It provides gross and spectral gamma radiation characterization data. Survey of the ventilation tunnel at the Hanford Site's 221-U Facility using the Quantrad Scout sensors was accomplished as part of the Canyon Disposition Initiative (CDI) Project. The CDI Project is analyzing alternatives for the final disposition of the five large chemical processing facilities (canyons) at the Hanford Site. The 221-U Facility serves as the pilot facility for the CDI Project.

The sensors were deployed as part of the initial characterization of the ventilation tunnel in the 221-U Facility. No human access has been allowed in this tunnel since construction, nearly 50 years ago.

The objective of the sensor deployment was to provide data from multiple areas of the tunnel to supplement the limited number of smear samples collected during the characterization effort.

### INNOVATIVE TECHNOLOGY DESCRIPTION

The Quantrad Scout system consists of three parts: the Scout base, a palmtop computer, and a probe. The Scout base includes a 512-channel Multi-Channel Analyzer (MCA), a high voltage power supply, and memory circuitry for storing spectra. The palmtop computer provides an interface to the Scout MCA unit. A number of different probes can be used with the Scout base. The system is small and durable and can operate using a transformer or a 12-volt battery.

Measurement of high- and low-energy gamma emissions was accomplished using two separate Scout sensors. One Scout unit included a low-energy optimized detector; the other unit included a high-energy optimized detector. The units were calibrated and configured to perform repeated 3-minute counts until the memory was full, the power dropped below a set value, or the instruments were manually shut off.

The Scout system, while commercially available, is usually deployed in a manually operated mode for specific analysis. The 221-U Facility deployment used the Scout system in a different configuration in conjunction with a robot deployment platform.

### BASELINE DESCRIPTION

Prior to this deployment, the physical and radiological conditions of the ventilation tunnel were unknown and, as such, personnel access was prohibited. This remote sensor characterization

system was considered an enabling technology. Previously, robot remote characterization platforms have been used to collect smear samples during characterization in other areas where personnel access was prohibited.

### **DEPLOYMENT DESCRIPTION**

The initial characterization of the ventilation tunnel in the 221-U Facility was completed in September 1999. Scout sensors were placed in steel boxes with “ports” for radiation measurement and wrapped for contamination protection. The boxes included batteries sufficient for 30 hours of operation, much longer than the planned deployment. Each unit was in an individual box. The units were transported

into the tunnel using a robot deployment platform (the Andros robot) and collected spectra over the desired time period.

### **DETAILS OF BENEFITS**

Use of the Scout sensors provides a means for gamma spectroscopy in remote locations and delivery by robot deployment platforms. Thus, enhanced radiological characterization data may be obtained for locations where personnel access is prohibited.

### **CONTACTS**

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